

REMARKS

Claims 2-3, 5, 7, 13, 18-22, 24-25, 33 and 34 are pending. No claim amendments were made in the present response.

Request for Interview Prior to Formal Action on Amendment

Applicants request an interview prior to formal action on this response. An “Applicant Initiated Interview Request Form” accompanies this response. Please contact Applicants’ undersigned representative to schedule the interview.

Prior art rejections

Claims 3, 7, 18, 25 and 34 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,975,638 (Evans).

Claims 2, 5, 13, 19, 20 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Evans in view of U.S. Patent Application Publication No. 2005/0035775 (Zhou et al.), hereafter, “Zhou.”

Claims 3, 21, 22 and 33 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Evans in view of U.S. Patent Application Publication No. 2005/0012513 (Cheng et al.), hereafter, “Cheng.”

Applicants traverse all of the prior art rejections for at least the following reasons.

1. Patentability of independent claim 7 over Evans

Claim 7 reads as follows (underlining added for emphasis):

7. A probe module comprising:
a probe base having a plurality of conductive metal traces;
a plurality of probe pins attached to the probe base, each of the probe pins comprising an elongated body wherein at least part of the elongated body is bonded to the plurality of conductive metal traces of the probe base;
a circuit interconnect device for connecting the plurality of probe pins to an inspection apparatus; and
a compression arm attached to the probe base and configured to engage the plurality of probe pins.

In the outstanding Office Action, the Examiner states that the probe contacts 16 in Evans are equivalent to the claimed plurality of probe pins. The Examiner further states that the probe contacts 16 have a “middle section” that constitutes the claimed “elongated body.” Applicants respectfully disagree with this analogy.

Fig. 4 of Evans merely discloses traces T, each having a first end that terminates at a contact point, referred to as a “probe contact 16” (not labeled in any of the figures), and a second end that terminates at a “probe terminal 17.” Evans provides a detailed description of the relationship between the traces T and the probe contacts 16 on column 5, lines 7-24.

Nowhere does Evans disclose or suggest that the probe contacts 16 have any “elongated” structure or body. The only elongated structure or body in Evans’s flexible film contactor 12 (deemed equivalent to the claimed probe base by the Examiner) is the plurality of conductive traces T. In fact, Evans describes the probe contacts 16 as being “minute bumps” (column 5, line 12). Thus, at best, referring to Applicants’ claim language, Evans describes a plurality of probe pins (i.e., conductive traces T), each having a probe pin tip (i.e., probe contact 16).

In sum, Evans lacks any disclosure or suggestion of the claimed “probe pins comprising an elongated body.”

The Examiner further states that the compression block 13 and spring member 14 of Evans, taken together, is equivalent to the claimed compression arm that is attached to a probe base and configured to engage probe pins. Applicants also respectfully disagree with this analogy. The combination of the compression block 13/spring member 14 is not attached to the element that the Examiner identified as being equivalent to the claimed probe base, namely, the flexible film contactor 12. Instead, the combination of the compression block 13/spring member 14 is attached to mounting frame 11 (mislabeled as element 13 in Fig. 10). The combination of the compression block 13/spring member 14 is “urged against” the flexible film contactor 12, as described on column 4, lines 32-39 of Evans.

An element that is “urged against” another element is not “attached to” the other element. “Urging against” and “attaching” are completely different concepts. To “attach” means to

“secure something to something else,” or “to append or fasten one thing to another.”¹ To “urge” means to “to force or drive forward or onward; impel.”²

In sum, Evans lacks any disclosure or suggestion of a compression arm attached to a probe base.

2. Patentability of independent claim 18 over Evans

Claim 18 reads as follows (underlining added for emphasis):

18. A probe pin for a probe module having a probe base including a compression arm, the probe pin comprising:
a probe pin body that is elongated and has at least a portion bonded to a conductive metal trace of the probe base;
a probe pin head extending from the probe pin body; and
a probe pin tip provided on the probe pin head, wherein the compression arm is attached to the probe base and is configured to engage the probe pin.

In the outstanding Office Action, the Examiner states that the flexible film contactor 12 is equivalent to the claimed probe base, and that the combination of the compression block 13 and spring member 14 of Evans, taken together, is equivalent to the claimed compression arm. However, the flexible film contactor 12 does not include the compression block 13 or the spring member 14. The flexible film contactor 12, the compression block 13, and the spring member 14 are completely separate parts of a test probe assembly card, as described on column 4, lines 32-39 of Evans. Accordingly, Evans does not disclose or suggest “a probe base including a compression arm,” as recited in claim 18.

The Examiner further states that the probe contacts 16 in Evans are equivalent to the claimed plurality of probe pins. Accordingly, the Examiner’s position is that a probe contact 16 is equivalent to the claimed probe pin. The Office Action is silent as to what is equivalent to the claimed “probe pin body,” “probe pin head” and “probe pin tip.”

¹ Encarta® World English Dictionary [North American Edition] Copyright © 2006 Microsoft Corporation. Developed for Microsoft by Bloomsbury Publishing Plc.

² The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company.

Evans describes the probe contacts 16 as being “minute bumps” (column 5, line 12). A minute bump cannot read on all three elements of the claimed probe pin, namely (i) a probe pin body, (ii) a probe pin head, and (iii) a probe pin tip. At best, a minute bump may constitute only one of these three elements, such as a “probe pin tip.” In contrast to Evans, Applicants are claiming a probe pin having three distinct structural elements. Preferred embodiment of such a probe pin are shown in Figs. 5A-7C, as follows:

- (i) probe pin body 38
- (ii) probe pin head 40
- (iii) probe pin tip 42

In sum, the Evans fails to disclose or suggest any structure equivalent to the claimed “probe pin.”

Evans also fails to disclose or suggest a compression arm attached to a probe base for the same reasons as given above with respect to claim 7.

3. Patentability of independent claim 21 over Evans in view of Cheng

Claim 21 reads as follows (underlining added for emphasis):

21. A probe module comprising:
 - a probe base having a plurality of conductive metal traces, the probe base being defined by a first end and a second end;
 - a plurality of probe pins electrically connected to the conductive metal traces of the first end of the probe base;
 - a flexible circuit board electrically connected to the conductive metal traces of the second end of the probe base, thereby allowing the plurality of probe pins to be electrically connected to the flexible circuit board via the plurality of conductive metal traces; and
 - a compression arm attached to the probe base and configured to engage the probe pins.

In the outstanding Office Action, the Examiner states that the flexible film contactor 12 is equivalent to the claimed probe base. The structure of the flexible film contactor 12 is described, in part, on column 5, lines 7-25 of Evans. The Examiner defines the claimed “first end” of the flexible film contactor 12 as being the end that comes in contact with a device under test, and the “second end” as being the end connected to the testing apparatus. That is, the Examiner has arbitrarily associated a probe contact 16 at the end of one of the traces T in center zone Z of the

flexible film contactor 12 as being one of the ends, and a region along the edge of the flexible film contactor 12 where the trace T terminates as being the other end. Applicants respectfully disagree with this analogy because these regions do not define “ends” of a probe base. Instead, they merely define regions of a probe base. An “end” is “either extremity of something that has length.”³ Points in the center zone Z of Evans clearly do not meet the definition of an “end.” While points in the center zone Z define extremities of the trace T, they are not extremities of the flexible film contactor 12 (probe base), as required by the claim language.

If a trace T extended from quadrant Q1 to Q3 (or quadrant Q2 to Q4) of Evans with one end of the conductive trace T being in contact with a device under test, and the other end of the conductive trace T being connected to the testing apparatus, then the Examiner’s analogy might arguably be closer to the claim language. However, the traces T in Evans extend from edges of the rectangular contactor 12 towards the center of the contactor 12. Thus, the Examiner’s “end” analogy is not appropriate.

In contrast to Evans, Applicants are claiming a probe pin having two clearly defined ends as this term is understood by those skilled in the art, each end containing the recited structure. In sum, Evans fails to disclose or suggest any such structure.

Evans also fails to disclose or suggest a compression arm attached to a probe base for the same reasons as given above with respect to claim 7.

Cheng was relied upon for the “flexible” circuit board and does not make up for any of the above-noted deficiencies in Evans.

4. Patentability of dependent claims

The dependent claims are believed to be allowable because they depend upon respective allowable independent claims, and because they recite additional patentable steps and elements. Zhou also does not make up for any of the above-noted deficiencies in Evans.

³ The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company.

Conclusion

Insofar as the Examiner's rejections were fully addressed, the instant application is in condition for allowance. A Notice of Allowability of all pending claims is therefore earnestly solicited.

Respectfully submitted,

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